

a. The supplier agrees to work with the State to develop the network questionnaire. This questionnaire will be offered through the “State Computer Store” and provided upon request without a fee. This questionnaire must be sent out to customer agencies inquiring about the agency needs for network design and installation. The purpose of the Network Planning Questionnaire will be to assess the user requirements and to document network configurations. After determination has been made as a result of the questionnaire, a Network Planning Guide may be developed at a fee to the customer. The subject areas solicited are set forth in Exhibit V-P.

GECITS **exceeds** the RFP requirements, as we have already developed a Network Planning Questionnaire for use by the State, which we include at the end of this section. If this questionnaire is, for any reason, unacceptable to the State, we will work with the State to develop a questionnaire that is acceptable to both parties.

GECITS will provide the Network Planning Questionnaire upon request, without a fee, via electronic mail and fax. We will provide the questionnaire to agencies inquiring about needs for network design and installation services.

The purpose of the Network Planning Questionnaire will be to assist the State in collecting data in order to assess user requirements and document network configurations. After a determination has been made as a result of the questionnaire, we will develop a Network Planning Guide, if requested, for a fee to the customer. We understand that the subject areas solicited are set forth in RFP Exhibit V-P. We provide additional information pertaining to the items in RFP Exhibit V-P in our response to Item E in this section.

The format of our Network Planning Questionnaire is based on the extensive analysis of technical and business needs of each customer. In a continuous effort to provide quality service, GECITS recommends that the questionnaire be completed by individuals at various levels within an organization (managers, engineers, administrators, end-users, etc.).



b. The supplier's network installation questionnaire will be used to assist in the assessment of network planning and recommended product configurations for network installations.

GECITS will use the Network Planning Questionnaire to assist in the assessment of network planning and recommended product configurations. In response to this requirement, we address the first item in the evaluation criteria: how the questionnaire will be used in recommending product configurations for network installations.

In order to achieve the goals and expectations of the agency, department, county, or other government entity, we must first understand the needs of that entity. GECITS network systems engineers will assist the State by reviewing the submitting agency's Network Planning Questionnaire, and developing a requirements document that will provide high-level information regarding the appropriate solution to the needs identified utilizing the Network Planning Questionnaire. The Network Planning Questionnaire is structured to produce a network that:

- ☐ Meets the ordering agency's business need
- ☐ Is modular in design so that it will maximize the longevity of the network
- ☐ Provides ease of usability
- ☐ Provides ease of maintenance
- ☐ Is highly stable and fault-tolerant with no single point of failure
- ☐ Provides increasing user productivity
- ☐ Provides security for sensitive data

The following process will be used to assess the Network Planning Questionnaire and/or guide to ensure that we properly recommend product configurations for network installations that will support the ordering agency's business need:

- ☐ Evaluate the submitted Network Planning Questionnaire
- ☐ Develop a needs assessment and identify user requirements
- ☐ Develop conceptual and schematic diagrams

Below, we describe each of these tasks.

Evaluate the Submitted Network Planninn Questionnaire

The first step in developing a proper hardware and software recommendation will be to review the completed Network Planning Questionnaire with the State agency who submitted the document. This review process will help refine the contents of the Network Planning Questionnaire and allow GECITS to develop an IT solution to meet the agency's specific needs.

Develop a Needs Assessment and Identify User Requirements

GECITS network systems engineers will work with the submitting agency to develop a needs assessment and list of user requirements that must be met by the proposed solution. This task will generate a list of products that can be used to meet the submitting agency's needs and user requirements.

Develop Conceptual and Schematic Diagrams

GECITS network systems engineers will develop conceptual and schematic design diagrams of the proposed solution. The conceptual design will include information such as operating system recommendations, storage requirements, network addressing schemes, hardware/software recommendations, and other elements as dictated by the needs assessment.



c. In responding to the RFP, the supplier must describe the process, which will be used to meet the State's requirement for "for-fee" network design service and the titles of State Computer Store staff who will create the design. The design service will be based on information contained from the questionnaire or completed Network Planning Guide, as well as meetings conducted with the ordering agency.

The result of this design must provide a functional description of the network, supported by a detailed product list. This product list must, at a minimum, give quantities, brands, models and product numbers. As a result of this network design service, the supplier must warrant the hardware will connect and integrate as proposed, and the applications and integrity of the network will meet the needs identified in the Network Planning Guide when purchased through their contract.

GECITS will provide a "for-fee" network design service that will be based on the information contained in the Network Planning Questionnaire or completed Network Planning Guide, as well as meetings with the ordering agency. The result of the design will provide a functional description of the network, supported by a detailed product list. At a minimum, the product list will provide quantities, brands, models, and product numbers. GECITS will warrant that the hardware will connect and integrate as proposed, and that the integrity of the network will meet the needs identified in the Network Planning Guide.

In response to this requirement, we address how we will meet each of the requirements above within the following topics:

- ☐ For-Fee Network Design Process
- ☐ Staff who will Create the Design

In addition: in response to this requirement, we address the first part of the second item in the evaluation criteria: the network design process Proposed.

For-Fee Network Design Process

GECITS will provide "for-fee" network design services. The process that GECITS will utilize to provide "for-fee" network design services is comprised of the following tasks:



- ❑ Goal Setting and Business Requirements
- ❑ Existing Network and New Technology Review
- ❑ Developing Implementation Plans

Below, we discuss each of the above in greater detail. To complete this section, we provide a summary of the network design services deliverables.

Goal Setting and Business Requirements

Computer networks are designed to allow for the sharing of information such as files, electronic messages, applications; and resources such as disk drives, printers, modems and faxes. When designing a network an important question to ask is ‘What do I want the end result to be?’ The end result can be as complex as implementing an E-mail system for a nationwide network, or as simple as sharing a printer.

The State has recognized a need for networking in order to share resources, but where are the jobs and functions that must be carried out? Which applications or programs are needed? Once a customer’s goals and business needs have been identified, then we can identify the appropriate products that will be the foundation of the network.

Existing Network and New Technology Review

Network technologies are developing and evolving at a very rapid pace. As part of the “for-fee” design services, GECITS will assess the existing network to ensure that the proposed solution will integrate as needed with the existing system. GECITS will review the following during the technology review, which we discuss in greater detail below:

- ❑ Existing Power and Electrical Outlets
- ❑ Existing Data Cabling
- ❑ Types of Servers
- ❑ Network Clients
- ❑ Network Printers
- ❑ Network Backup System
- ❑ Internetworking Components
- ❑ Metropolitan Area Networking and Wide Area Networking

Existing Power And Electrical Outlets

It is important to ensure that there will be adequate power to run all computer equipment. It is equally important to have outlets in all of the computing equipment locations.

Existing Data Cabling

Different cabling systems offer different performance characteristics. The range of data rate that a cabling system can support is known as the usable bandwidth. Bandwidth capability is dictated by the electrical performance characteristics that cabling components exhibit. This issue becomes especially important when planning for future applications, which place greater demands upon bandwidth and the cabling system. In addition, when selecting a new cabling system, one must consider the number and type of patch cables for each node, existing cables installed in walls, patch panel location, connectivity to wiring hubs, and extra cables.

Types of Servers

There are two main types of servers that are used on a Local Area Network: file/print servers and application servers. A server's hardware and software configuration is determined by the following questions:

- ☐ What operating system is the server running?
- ☐ What network services is the server providing?
- ☐ How many simultaneous users does the server need to support?
- ☐ How many printers will the system support?
- ☐ What are the memory and other requirements for the applications that will be hosted on the server?
- ☐ What is the growth plan for this server and the services it provides?
- ☐ How critical is the data stored on this system? How much downtime can be tolerated?
- ☐ What hardware is officially supported by the operating system vendor?



Network Clients

Workstations are the workhorses of any network. Most of the processing occurs at the workstation level. Particular attention needs to be devoted toward the following aspects:

- ☐ Processor speed
- ☒ Hard disk capacity
- ☐ Network card
- ☐ Video card

These four elements are very important in properly sizing the workstation hardware requirements. In general, the most cost-effective way to increase workstation performance is to add additional memory. When evaluating operating systems and applications, the real-world approach is to double the amount of RAM required and use a CPU from the current Intel family of processors.

Network Printers

Because of the high cost of printers, we recommend that each customer attach all laser printers, high-speed printers, and plotters to the network so that the end-user community will be able to share the printers. Most printer manufacturers provide an option kit that will allow their printers to attach directly to an Ethernet or token ring network. Additionally, several manufacturers offer external devices that will connect parallel printers to an Ethernet or token-ring network.

Network Backup System

One of the best means of providing redundancy and data protection in a networking environment is the concept of backup. Since in most environments, end-users do not take the necessary precautionary measures of backing up their own hard drives, it falls upon the network administrators to enforce policies to ensure that mission-critical data is not stored on local workstations. In the event that there is a business requirement to store data on workstations, there are several backup systems that are capable of backing up both file server and workstations data.



Internetworking Components

Internetworking devices such as routers, switches, gateways, and bridges are devices that can connect two or more networks together to create an Internetwork (Metropolitan Area Networking or Wide Area Networking) environment. In addition, these devices can reduce network traffic, provide more network security and enable users from a wide variety of computing environments to communicate with each other.

Metropolitan Area Networking (MAN) and Wide Area Networking (WAN)

For many customers, as soon as they establish a local area network (LAN), they face the need to expand the connectivity beyond the thousand feet or so of cable that defines the term “local.” This would mark the transition from a LAN to a MAN or WAN.

A MAN joins two or more LANs but is usually restricted to a single city or campus environment. A MAN typically involves high-speed network switches, fiber optic cabling, and possibly routers. MANs generally do not utilize a common carrier.

A WAN is a combination of LANs or MANs joined together. A WAN utilizes a common carrier. Telephone companies typically provide wide area connections, although other connection options, such as wireless links are available. An important thing to note is that wide area connections create a need for customers to be more diligent with security, and more disciplined with network design documentation.

Developing Implementation Plans

Following the existing systems and new technology review, GECITS network systems engineers will prepare a detailed implementation plan that will assist in installing the proposed network. The complete implementation plan will include the following items:

- ❑ Complete functional description of the network
 - a Detailed systems architecture diagrams containing network segmentation and connectivity
- ❑ Physical diagrams including cabling recommendations and wire closet designs
 - a Logical diagrams of the file server(s) and workstations



- ❑ Complete list of hardware and software required to implement the proposed solution including: quantities, brands, models, and product numbers
- a Detailed operational support requirements
- ❑ Detailed cost information

GECITS' designs will meet all specifications for the network architecture under consideration. For cabling, if no wire closets are available, GECITS will determine the placement and dimensions for the wiring closet in addition to any electrical requirements.

To assist them in developing the solution, GECITS network systems engineers will utilize GE's GENius™ Methodology. The GENius Methodology uses a series of structured Service Delivery Kits (GENiusKits™) that leverage the best practices and knowledge of our field experts in order to ensure repeatable success for IT related projects. In the following subsection, we provide an in-depth discussion of our GENius Methodology.

GENius Methodology

When providing project-based services to create business solutions, the temptation often arises to “reinvent the wheel.” After all, each customer has different needs and demands, and requires a customized approach. However, with the creation of GE's GENius Methodology, the foundation is in place to provide a custom solution without unnecessarily duplicating efforts, thus resulting in the most consistent, efficient service possible.

The GENius Methodology is a proprietary one that serves as a framework to provide customers with optimized solutions, employing a system of rules, principles, procedures, and practices that are applied to information technology solutions. It assures that complex projects can be completed with repeatable consistency and predictable cost, while maximizing resources, delivering measurable, high-quality results, and ultimately leading to greater customer satisfaction.

The GENius Methodology allows GECITS to leverage our intellectual talent by combining it with technical expertise and best practices. The process allows for consistency on both a national and global scale, and is flexible and adaptable to our customers' changing technological needs.

Beginning in the solution planning and design stage, the GENius Methodology extends through the **implementation**, measurement, and closure processes to enforce cohesiveness for the entire engagement. The GENius Methodology



was developed through GE's Six Sigma quality standards, which provide a blueprint for service excellence.

The GENius Methodology employs a series of structured Service Delivery Kits (GENius Kits) that combine the best practices and knowledge of the company's field experts. Each GENius Kit contains sales tools, project management tools, technical delivery tools, and instructions for use. In addition, other components are available depending on the type of solution. This modular approach allows project managers to combine components from various kits into a cohesive project plan and to scale the kits based on the project's complexity.

The GENius Methodology approaches IT projects by dividing them into appropriate phases. Typically, these phases include:

- ☐ Detailed Needs Assessment (this will be completed in conjunction with the Network Planning Questionnaire/guide)
- ☐ Planning, Design, and Systems Architecture
- ☐ Testing and Validation
- ☐ Pilot Deployment
- ☐ Deployment
- ☐ Training

A project plan is used to model the delivery process and is used to enforce the structure.

Each GENius Kit includes service delivery tools and detailed instructions for use. They provide the GECITS team with the foundation to produce consistent, high quality, structured deliverables for each solution. Most of the information contained within the GENius Kits is proprietary and confidential and cannot be released to the general public. Currently, the following GENius Kits are being actively used to support our customers IT needs:

- ☐ Windows 2000 Readiness Evaluation
- ☐ Windows 2000 Server Planning and Deployment
- ☐ Windows 2000 Professional Planning and Deployment
- ☒ Windows 2000 Active Directory Planning and Deployment
- ☐ Microsoft Exchange Planning and Deployment
- ☐ Windows NT Server 4.0 Planning and Deployment
- ☐ Microsoft Office 2000 Planning and Deployment



- ☐ Cisco Branch Router Installation
- ☐ Network Baseline Assessment

In addition, the following GENius Kits are in their final stages of development and should be available for use in 2001:

- ☐ NetWare 5.x Planning and Deployment
- ☐ CiscoWorks 2000 Planning and Deployment

The GENius Kits include the following components depending on the type of engagement:

- ☐ Needs Assessment Template (will work in conjunction with Network Planning Questionnaire/guide)
- ☐ Solution Discovery Document
- ☐ Resource Guide
- ☐ Project Plan Schedule
- ☐ Work Packages
- ☐ Technical Tool Requirements
- ☐ Training Requirements
- ☐ Customer Documentation Deliverables
- ☐ Project Closure Templates

Without using the GENius Kits, every engagement becomes a custom job. This is time-consuming and does not consistently provide the same quality results. By using the GENius Kits, we can leverage our intellectual talent and make it available to other technical resources to increase their capabilities. We will also be able to better apply the appropriate skilled resource for specific work package tasks. Use of the GENius Kits will benefit the State by providing consistent service deliverables and enhanced customer satisfaction.

For-Fee Network Design Services Deliverables

The deliverables of the “for-fee” network design services will minimally include:

- ☐ Detailed design drawings including physical and logical network diagrams
- ☐ A functional description of the network



- ❑ A detailed product list including quantities, brands, models, and product numbers
- ❑ Statement of Work to implement proposed network
- ❑ A warranty that the hardware will connect and integrate as proposed, and that the applications and integrity of the network will meet the needs identified in the Network Planning Questionnaire and/or Guide
- a Detailed cost proposal for the GECITS recommended implementation plan

GECITS will develop the Statement of Work after reviewing the detailed design documents with the customer, and after conducting additional interviews with agency personnel to define the implementation schedule. The Statement of Work will include a Project Plan that:

- ❑ Identifies all the tasks to be completed
- ❑ Identifies all the resources required
- ❑ Includes an implementation schedule
- ❑ Includes a change management process for changes made ~~after~~ project initiation
- ❑ Includes an acceptance process for the completion of project phases and deliverables

Once approved by the customer, all project documentation will be forwarded to GECITS network systems engineers, who will perform the installation. Upon the completion of installation, the customer will review the project for completeness, and if satisfied, sign off the project as complete.

Staff Who will Create the Design

GECITS network system engineers will provide “for-fee” network design services to develop and design networks based upon cutting-edge technology. We will identify the specific network system engineer assigned to each project on all project documentation.



d. In responding to the RFP, the supplier must describe the ranges of complexity used in their organization (i.e. 3 levels; trivial, simple, difficult) and the features within each level that differentiates one level from another (i.e. trivial involves no host communication, simple involves multiple application software, etc. The level titles used must be listed in Table 14- NETWORK SERVICES.

In response to this requirement, we address the second part of the second item in the evaluation criteria: description of ranges of network complexity.

In order to appropriately describe our ranges of network complexity, we first provide, in Table C4-1, a definition of each network type.

Table C4-1. Network Type Definitions

<i>Description</i>	<i>Definition</i>
Local Area Network	A single Ethernet or Token ring segment that provides connectivity for one or more workstations to resources on the same segment. This type of network allows end users to share files, printers, electronic mail, and access host system on the same network segment. Simple LANs are generally restricted to one physical location, such as a floor, office, or building. Does not require use of a common carrier.
Metropolitan Area Network	A MAN joins two or more LANs but is usually restricted to a single city or campus environment. A MAN typically involves high-speed network switches, fiber optic cabling, and possibly routers. MANs generally do not utilize a common carrier.
Wide Area Network	A WAN is a combination of LANs or MANs joined together. A WAN utilizes a common carrier.



In Table C4-2, we provide descriptions that identify the three levels of network complexity used in our organization, and the features that differentiate one level from another. The level titles used are listed in Cost Table 14-NETWORK SERVICES.

Table C4-2. LAN, MAN, and WAN Complexity

<i>Local Area Network</i>		
Simple	Trivial	Difficult
<ul style="list-style-type: none"> ⌘ A single operating system ⌘ A single system architecture ⌘ Twisted Pair, Coax, or Type 1 Cabling ⌘ A single network protocol (IP, IPX, etc.) ⌘ A single logical topology ⌘ No WAN or MAN connectivity 	<ul style="list-style-type: none"> ⌘ A single operating system ⌘ Any type of cabling ⌘ Two network protocols • Any logical topology ⌘ A DDS, T1, or fractional T1 communication line 	<ul style="list-style-type: none"> ⌘ Any combination of operating systems ⌘ Any systems architecture ⌘ Any combination of network protocols • Any logical topology ⌘ Any internetworking device ⌘ Any type of WAN communication line
<i>Metropolitan Area Network</i>		
Simple	Trivial	Difficult
<ul style="list-style-type: none"> ⌘ A single operating system ⌘ A single system architecture ⌘ Twisted Pair, Coax, or Type 1 Cabling ⌘ A single network protocol (IP, IPX, etc.) ⌘ A single logical topology ⌘ No WAN or MAN connectivity. 	<ul style="list-style-type: none"> ⌘ A single operating system ⌘ Any type of cabling ⌘ Two network protocols • Any logical topology ⌘ A DDS, T1, or fractional T1 communication line 	<ul style="list-style-type: none"> ⌘ Any combination of operating systems ⌘ Any systems architecture ⌘ Any combination of network protocols • Any logical topology • Any internetworking device ⌘ Any type of WAN communication line



<i>Wide Area Network</i>		
Simple	Trivial	Difficult
N/A	<ul style="list-style-type: none"> • A single operating system • Any type of cabling • Two network protocols • Any logical topology • A DDS, T 1, or fractional T1 communication line 	<ul style="list-style-type: none"> ≠ Any combination of operating systems ≠ Any systems architecture ≠ Any combination of network protocols ≠ Any logical topology ≠ Any internetworking device ≠ Any type of WAN communication line



e. In responding to the RFP, the supplier must provide a narrative description of how they will install and ensure their network design fulfills the ordering customer's network needs as a result of the Network Planning Questionnaire. See Exhibit V-P for minimum areas needing discussion. The supplier is encouraged to augment this list.

GECITS will install and ensure that our network design fulfills the ordering customer's network needs as a result of the Network Planning Questionnaire.

GECITS network systems engineers will utilize GE's GENius Methodology, as described earlier, as a tool to help ensure that the network is installed appropriately, and that the design meets the customer's needs.

Regarding installation, below we present the specific tasks associated with the installation of the following, as identified in RFP Exhibit V-P:

- ☐ Network Design Service
- ☐ Network File Server
- ☐ Bridge, Router, and Gateway
- ☐ Input/Output Device
- a Network User
- ☐ Network Application Software
- ☐ Other Areas

Network Design Service

GECITS network systems engineers will perform the following for network design services:

- ☐ Provide schematics of the file server(s) and workstations
- ☐ Provide equipment and software recommendations
- a Using State pricing, specify costs for all subsequent network installation services

Network File Server Installation

GECITS engineers will perform the following tasks during a network file installation:



- ❑ Unbox all equipment- we will unbox, inspect, and verify that all related hardware on the purchase order is in perfect condition. If the system hardware was configured by the manufacturer, we will check the configuration to ensure it meets order specifications.
- ❑ Install and configure server-we will install, configure, and test all server CPU components required for the network operating system **software** to function properly at its default parameters (i.e. memory components, fixed disk units, network interface cards, etc.)
- ❑ Setup file server hardware including:
 - ❏ Hard drives
 - ❏ Disk controllers
 - ❏ Install additional **RAM**
 - ❏ Install video board
 - ❏ Install SCSI adapters
 - ❏ **Install** network cards

We will set up all related hardware in an area specified by the user. We connect the hardware to power, and power it up to **verify** that it passes the power on self-test.

- ❑ Install system operating software – if the installation requires system operating **software** as a foundation for the network operating system, we will create the necessary disk partitions and install the system operating **software** to properly support the network operating system.
- ❑ Test and **confirm** operating system boot-we will verify the operating system boot by cold starting the system, and recording and correcting any erroneous startup errors.
 - a Install network operating system – we will load the network operating system software, create all necessary volumes according to plan, create and customize start-up files to support the installed hardware, and install any default **menus** that are part of the network operating system software.
- ❑ Test and confirm system boot – we will reboot the system to ensure that all start-up files work correctly, that the driver **software** loads properly, and that the network operating system starts with no errors.



- ❑ Attach cables to existing building wiring – before we attach a file server to the existing building cabling, we will cable the file server to the engineer's laptop to ensure network communications are stable, and that they will not affect any networks existing at the site.
- a Configure file server operating system including:
 - ❑ Server name
 - ❑ IP address
 - ❑ IPX address
 - ❑ Software RAID
 - ❑ Other tunable operating system parameters
- ❑ Install and configure backup applications – if applicable.
- ❑ Create user accounts and groups and assign appropriate network rights to users and groups
- ❑ Test and confirm system boot – we will complete this step one more time to ensure that the system boots properly.
- ❑ Test and confirm network supervisor/admin rights and login – we will confirm supervisor login from either an installed workstation or the engineer's laptop
- ❑ Clean-up area and organize literature – we will remove all boxes and packing material from the customer area. We will then place all warranty cards, manuals, and other related literature in an area designated by the customer. We will place a label that includes the configuration detail, serial numbers, date of purchase, invoice numbers, phone numbers, etc. in a convenient location.
- ❑ Document installation – we will complete all paperwork as necessary to document the successful completion of the installation.

Bridge, Router, and Gateway Installation

GECITS network systems engineers will install and configure bridges, routers, switches, and gateways per customer specifications. Specifically, we will perform the following tasks during this installation:

- ❑ Unbox and setup all hardware -we will unbox, inspect, and verify that all related hardware on the purchase order is in perfect condition. We will set-up all hardware and software components.



- ❑ Upgrade hardware microcode to latest OEM released version
- ❑ Install adapter cards for required LAN topologies
- ❑ Perform localized test – we will test all interfaces at the physical, datalink, and network level before connecting them to an existing network to ensure that all components work individually. We will connect a laptop to the device(s) via physical media to ensure the device is operating properly on its own network interface(s) before connecting to the network.
- ❑ Attach all cabling and connections to network and CSU/DSU hardware – we will physically attach all cables and connections to the network.
- ❑ Configure hardware
- ❑ Test and confirm installation, ensuring that all components work individually and as part of the network – we will test the device(s) for communication to its respective OSI model layers.
- ❑ Clean-up area and organize literature -we will remove all boxes and packing material from the customer area. We will then place all warranty cards, manuals, and other related literature in an area designated by the customer. We will place a label that includes the configuration detail, serial numbers, date of purchase, invoice numbers, phone numbers, etc. in a convenient location.
- ❑ Document installation – we will complete all paperwork as necessary to document the successful completion of the installation.

Input/Output Device Installation

GECITS engineers will install and configure various input/output devices including:

- ❑ Printers
- ❑ Scanners
- ❑ Monitors
- ❑ Plotters
- ❑ Mice/pointing devices
- ❑ Modems
- ❑ Universal serial bus devices



- ❑ WebCams
- ❑ FireWire (IEEE 1394) devices

As part of the input/output device installation, we will perform the following tasks:

- ❑ Unbox, configure, and setup hardware – we will unbox, inspect, and verify that all related I/O hardware on the purchase order is in perfect condition. If the I/O hardware was configured by the manufacturer, we will check the configuration to ensure it meets order specifications. We will set all related hardware in an area designated by the user, and then connect the hardware to power. We will then power-up the system hardware to verify that it passes the power on self test.
- ❑ Install system operating software – we will install the system operating software or device drivers in compliance with the I/O device specifications in order to access the physical device. We will set all the necessary switches for proper communication to take place.
- ❑ Install and test network interface components – before we install the network interface components, we will properly ground the installer for static discharge. If hardware switches exist on the interface, we will set them to proper DMA, I/O address, and memory address ranges. We will test the network interface adapter(s) with the accompanying test software to ensure that there are no conflicts and the adapter performs properly. We will load all interface software support layers for network access.
- ❑ Attach cables to existing building wiring – we will physically attach all cables and connections to the building wiring.
- ❑ Confirm system boot-we will verify system boot by cold starting the system, and recording and correcting any startup errors.
- ❑ Test and confirm installation, ensuring that **all** components work individually and as part of the network – when possible, we will connect crossover network cables to an engineer's laptop to create a small, localized network where the I/O devices can be tested before placing them on the network.



- ❑ Clean-up area and organize literature – we will remove all boxes and packing material from the customer area. We will then place all warranty cards, manuals, and other related literature in an area designated by the customer. We will place a label that includes the configuration detail, serial numbers, date of purchase, invoice numbers, phone numbers, etc. in a convenient location.
- ❑ Document installation – we will complete all paperwork as necessary to document the successful completion of the installation.

GECITS can also provide asset management services such as asset tagging and inventory services.

Network User Installation

GECITS will perform network user installation services, which consist of the following tasks:

- ❑ Logical installation of users onto network – we will install a network interface card in each computer to be used as a workstation, resolve any hardware conflicts, connect the workstation to an existing LAN cable system, and create a workstation boot disk or batch file to operate with the workstations default operating system that will allow users to access the network server. We will logically add all users to the file server according to their organizational groupings and security levels.
- ❑ Customize menus, security files, directories, and user **logins** – we will accomplish the customization of menus, directories, and security at the customer's site, or at a GECITS integration facility. We will customize **login** scripts according to organizational groupings, security levels, and directory access needs. We will typically customize menus in a hierarchical manner depending on the needs of the user.
- ❑ Configure desktop applications
- ❑ Test and confirm system boot – we will test and confirm system boot to ensure that all network batch processes load properly to ensure the system is set for user **login**.

- ❑ Test and confirm userlogin – we will test and confirm user login on-site with each user installation. We will test the login to ensure that the user canlogin, and that all mappings and security operate correctly for each user.
- ❑ Clean-up area and organize literature – we will remove all boxes and packing material form the customer area. We will then place all warranty cards, manuals, and other related literature in an area designated by the customer. We will place a label that includes the configuration detail, serial numbers, date of purchase, invoice numbers, phone numbers, etc. in a convenient location.
- ❑ Document installation – we will complete all paperwork as necessary to document the successful completion of the installation.
- ❑ Provide ‘new user’ network orientation

Network Application Sofhtvare Installation

GECITS has qualified engineers who are able to deploy thousands of network applications. In addition, several GENius Kits are available for Microsoft and Novell network applications. Specifically, we will perform the following tasks as part of the network application software installation:

- ❑ Install tile server application software – we will load software application programs, as certified by the network operating system vendor, onto a network server. We will then test the programs in a multi-user mode of operation.
- ❑ Install required node software -we will load workstation node software, and set it to the correct server drive mappings.
- ✍ Customize menus, security files, directories, and user access – we will update workstation menus to include the new applications. We will set security on the server to allow access to the user in the application directory. We will map icons to the applications when a graphical user interface is utilized.
- ❑ Test and confirm installation – we will test applications in the multi-user mode from the workstation. For testing, we will take into account the application initialization files and links.



- ❑ Clean-up area and organize literature -we will remove all boxes and packing material from the customer area. We will then place all warranty cards, manuals, and other related literature in an area designated by the customer. We will place a label that includes the configuration detail, serial numbers, date of purchase, invoice numbers, phone numbers, etc. in a convenient location.
- ❑ Document installation – we will complete all paperwork as necessary to document the successful completion of the installation.

Other Areas

Other areas needed to ensure the successful operation of the network according to the network design include the following:

- ❑ Power – all designs will call for adequate and uninterrupted system power. This equates to sufficient amperage, and at least surge suppressors, if not a means of supplying a UPS. Each system should be isolated on a fully grounded electrical circuit.
- ❑ Existing Power and Electrical Outlets – it will be important to ensure that adequate power exists to run all computer equipment. It is equally important to have outlets in all of the computer equipment locations.
- ❑ Existing Grounding – some older buildings will not have adequate electrical grounding. In order to protect the computing equipment, measures should be taken to ensure proper grounding.
- ❑ Existing Data Cables – different cabling systems offer different performance characteristics. The range of data rate that a cabling system can support is defined as the usable bandwidth. Bandwidth capability is dictated by the electrical performance characteristics exhibited by cabling components. This issue becomes especially important when planning for future applications, which place greater demands on bandwidth and the cabling system. When selecting a new cabling system, one should consider the number and type of patch cables for each node, the existing cables installed in walls, the patch panel location, the connectivity to wiring hubs, and extra cables.



- ❑ Fault Tolerance – mission-critical organizations should consider using a redundant array of inexpensive disks (RAID) system. Several layers of RAID support exist, ranging from total disk mirroring and fault tolerance, to standard disk duplexing. RAID systems exist that allow for hot swappable disk drives so that a faulty drive can be replaced without interrupting the server. One should keep in mind that disk mirroring an/or duplexing does not replace the need for implementing proper data backup procedures. In fact, a data backup device should be included in the design.
- ❑ Backup System – a backup system should include hardware and software capable of backing up multiple file systems, the capability to backup servers and workstations, and the implementation of media rotation methods.
- ❑ Anti-Virus Software -hackers are creating new viruses all the time, and these viruses can cause many network problems. Network anti-virus utilities can provide a certain level of protection against viruses that may make their way into the network. Some utilities provide a memory resident program such as a Netware **Loadable Module (NLM)** that scans files and programs for viruses. Other utilities utilize a Terminate Stay Resident (TSR) or executable program on each client PC to protect them from receiving an infected file from the network or other external sources.



GECITS Network Planning Questionnaire

Your Organization Information

Please fill in the appropriate data to the best of your knowledge. Based on the content of the following information, a meeting will be scheduled by an appropriate engineer.

Primary Contact Name _____ Secondary Contact Name: _____

Telephone Number: _____ Telephone Number: _____

E-mail Address: _____ E - m a i l A d d r e s s : _____

Organization Name: _____

Division: _____

Department: _____

Mailing Address: _____

City: _____ Zip Code: _____

Please indicate your primary job function:

- _____ LAN Management (Dir., Mgr., Supv, Project Leader, Consulting)
- _____ MIS Management (Dir., Mgr., Supv., Network Mgr, Technical Sup./Sys. Mgr.)
- _____ Network Management (Dir., Supv., Mgr., Project Leader)
- _____ Data Communications Management (Dir., Supv, Mgr., Project Leader)
- _____ Systems Analyst/Programmer
- _____ Other

Please indicate your site's primary function: _____

How many people are part of your organization: _____

Please make the appropriate selection:

